



United States  
Department of  
Agriculture

Agricultural  
Research  
Service

National Soil  
Dynamics  
Laboratory

Conservation  
Systems  
Research

Research  
Project  
Description  
No. 27

December 2003

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# Conservation Systems Research

## *Nitrogen Contribution of Peanut Residues in a Cotton Conservation Tillage System*

### RESEARCH PROJECT DESCRIPTION NO. 27



Rye planted into peanut residue

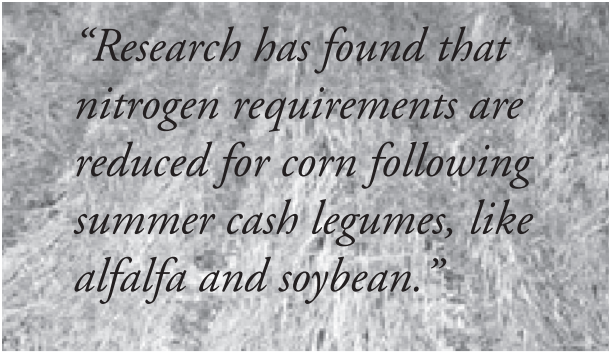
### Researchers

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### The Challenge

How much nitrogen does peanut residue contribute to subsequent crops?

The residue in a conservation tillage system can significantly influence the nutrient status of succeeding crops. The nitrogen content or, more precisely, the ratio between carbon and nitrogen of the residue, determines how the residue affects soil nitrogen. A residue with a low nitrogen content has a high carbon-to-nitrogen ratio (C/N) and does not contribute nitrogen to the following crop, while residues with high nitrogen contents and low C/N have the potential to contribute



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significant amounts of nitrogen to the following crop.

Studies on nutrient release from legume cover crops have focused primarily on crops such as crimson clover and hairy vetch. Research has found that nitrogen requirements are reduced for corn following summer cash legumes, like alfalfa and soybean. There is little information available about how residue from peanut, a common row crop of the Southeast, influences the nitrogen requirements of a cover crop and succeeding row crop. The effect of peanut residue on the nitrogen status of succeeding crops, such as cotton or a winter cereal cover crop could potentially lower nitrogen requirements and reduce production costs.



How much nitrogen will these peanut plants leave in their residue for following crops?

## The Experiment

The experiment was established in the spring of 2002 at the Alabama Agricultural Experiment Station's Wiregrass Research and Extension Center in Headland.

Our objectives are:

- Determine the nitrogen response of a rye cover crop to peanut residues.
- Examine subsequent nitrogen response of cotton following a rye crop grown in peanut residues.

Following peanut harvest in the experimental fields, peanut residue will be removed from some plots and retained in others. A winter rye cover crop is planted following peanut harvest and fertilized with different N rates (0, 30, 60, 90 lb N/acre). In the spring, the rye is killed and cotton planted and fertilized with the same nitrogen rates.

Following peanut harvest, peanut residue biomass and chemical content will be determined. The rye cover crop will be tested monthly, beginning in early spring, for biomass and nitrogen content to determine plant N uptake. Biomass and nitrogen content will also be collected from cotton plants to determine plant N uptake, in addition to chlorophyll content. Soil samples will be collected after peanut harvest and before cotton planting and analyzed for nitrate content.